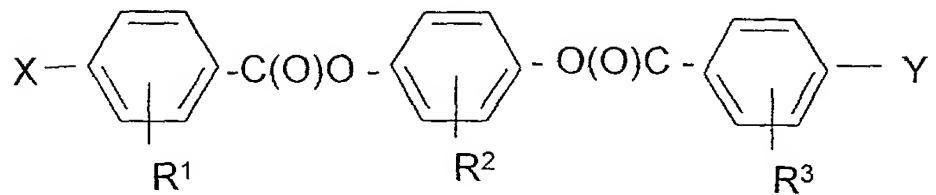


I Claim:

1 1. Mesogens having the following general formula:



3 wherein

4 X and Y independently are selected from the group consisting of terminal
 5 functionalities and polymerizable groups, provided that, when X and Y both
 6 are polymerizable groups, X and Y are other than bis- vinyl terminated
 7 groups;

8 R² is a bulky organic group having a bulk greater than R¹ and R³ whereby, when both
 9 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
 10 steric hindrance to achieve a nematic state at room temperature while
 11 suppressing crystallinity at room temperature, thereby providing effective
 12 rheology and workability at room temperature; and

13 R¹ and R³ are selected from groups less bulky than R² adapted to maintain said
 14 nematic state.

1 2. The mesogens of claim 1 wherein X and Y independently are selected
 2 from the group consisting of polymerizable groups.

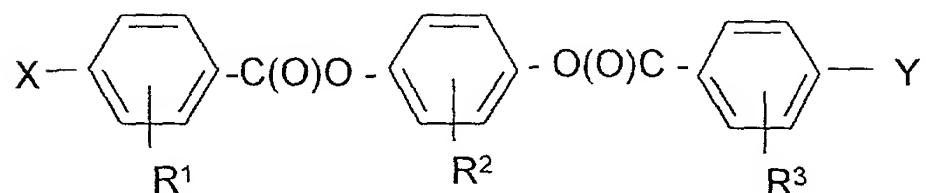
1 3. The mesogens of claim 1 wherein R² is selected from the group
 2 consisting of alkyl groups having from about 1 to 6 carbon atoms and aryl groups.

1 4. The mesogens of claim 2 wherein R² is selected from the group
 2 consisting of methyl groups, t-butyl groups, isopropyl groups, secondary butyl groups,
 3 and phenyl groups.

1 5. The mesogens of claim 1 wherein R² is selected from the group
 2 consisting of a methyl group and a t-butyl group.

1 6. The mesogens of claim 2 wherein R² is selected from the group
 2 consisting of a methyl group and a t-butyl group.

1 7. Mesogens having the following general formula:



3 wherein

4 X and Y independently are selected from the group consisting of terminal
 5 functionalities and polymerizable groups, said groups being independently
 6 selected from the group consisting of acryloyloxy groups, methacryloyloxy
 7 groups, hydroxyl groups, and acryloyloxy alkoxy groups, methacryloyloxy
 8 alkoxy groups, alkoxy groups and alkoxoyl groups comprising alkyl groups
 9 having from about 2 to about 12 carbon atoms, provided that, when X and Y
 10 are both polymerizable groups, X and Y are other than unsubstituted bis- vinyl
 11 terminated groups;

12 R² is a bulky organic group having a bulk greater than R¹ and R³ whereby, when both
 13 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
 14 steric hindrance to achieve a nematic state at room temperature while
 15 suppressing crystallinity at room temperature, thereby providing effective
 16 rheology and workability at room temperature; and
 17 R¹ and R³ are selected from groups less bulky than R² adapted to form said nematic
 18 state.

1 8. The mesogens of claim 7 wherein said alkyl groups have from about 2
2 to about 9 carbon atoms.

1 9. The mesogens of claim 7 wherein said alkyl groups having from about
2 2 to about 6 carbon atoms.

1 10. The method of claim 7 wherein said polymerizable groups are selected
2 from the group consisting of cinnamoyloxy groups, acryloyloxy groups,
3 methacryloyloxy groups, and thioalkyloxy grous, acryloyloxy alkoxy groups, and
4 methacryloyloxy alkyloxy groups comprising an alkyl moiety having from about 2 to
5 about 12 carbon atoms, said alkyl moiety comprising CH_2 groups, wherein one or
6 more of said CH_2 groups independently can be substituted by oxygen, sulfur, or an
7 ester group; provided that at least 2 carbon atoms separate said oxygen or said ester
8 group.

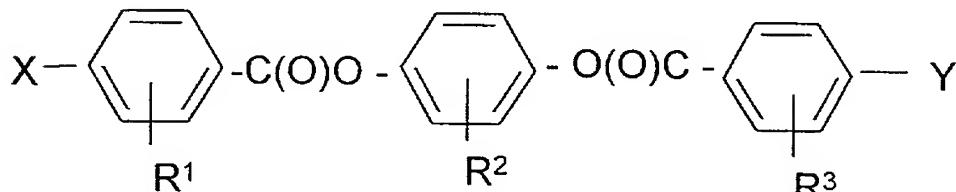
1 11. The mesogens of claim 7 wherein X and Y independently are selected
2 from the group consisting of acryloyloxy alkyloxy groups and methacryloyloxy
3 alkyloxy groups.

1 12. The mesogens of claim 11 wherein n is from about 2 to about 9.

1 13. The mesogens of claim 11 wherein n is from about 2 to about 6.

1 14. The mesogens of claim 11 wherein n is 6.

1 15. Mesogens having the following general formula:



2 wherein

3 at least one of X or Y is a polymerizable group; and

5 the other of X or Y is independently selected from the group consisting of
6 ester groups, organic acid groups, amine groups, hydroxyl groups,
7 sulphydryl groups, groups comprising a polymerizable unsaturated
8 carbon-carbon bond, and spacer groups provided that, when X and Y
9 are both polymerizable groups, X and Y are not bis-vinyl terminated
10 groups;

11 R² is a bulky organic group having a bulk greater than R¹ and R³, whereby, when both
12 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
13 steric hindrance to achieve a nematic state at room temperature while
14 suppressing crystallinity at room temperature, thereby providing effective
15 rheology and workability at room temperature; and

16 R¹ and R³ are selected from groups less bulky than R² adapted to form said nematic
17 state.

1 16. The mesogens of claim 15 wherein said polymerizable groups are
2 selected from the group comprising a polymerizable unsaturated carbon-carbon bond.

1 17. The mesogens of claim 15 wherein at least one of X or Y is selected
2 from the group consisting of cinnamoyloxy groups.

1 18. The mesogens of claim 15 wherein one of X or Y is selected from the
2 group consisting of acryloyloxy alkyloxy groups and methacryloyloxy alkyloxy
3 groups.

1 19. A quantity of said mesogens of claim 1 wherein a proportion of a
2 substituent selected from the group consisting of X, Y, and a combination thereof
3 comprises a crystallization retardant, said proportion and said bulky organic group
4 being effective to maintain said nematic state and to produce said effective rheology

5 and workability at room temperature.

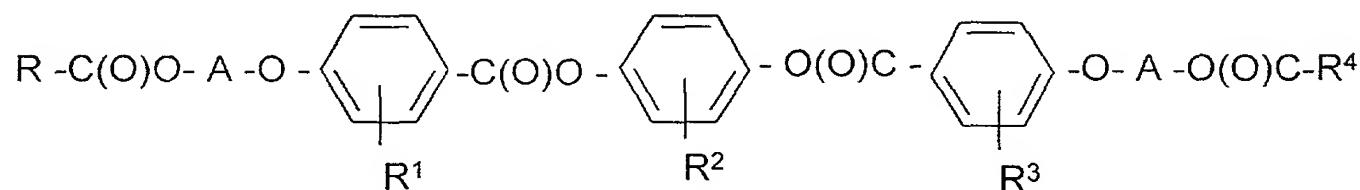
1 20. The mesogens of claim 19 wherein said crystallization retardant
2 comprises at least one halogen atom.

1 21. The mesogens of claim 18 wherein said halogen atom is selected from
2 the group consisting of chlorine, bromine, and iodine.

1 22. The mesogens of claim 19 wherein said proportion is from about 3 to
2 about 50 mole%

1 23. The mesogens of claim 19 wherein said proportion is from about 10 to
2 about 15 mole%

1 24. Mesogens having the following general structure:



6 wherein

7 A is selected from the group consisting of alkyl groups and methyl-substituted alkyl

8 groups having from about 2 to about 12 carbon atoms; and

9 at least one of R and R⁴ is a polymerizable group, provided that, when R and R⁴ are
10 both polymerizable groups. R and R⁴ are not bis-vinyl terminated groups;

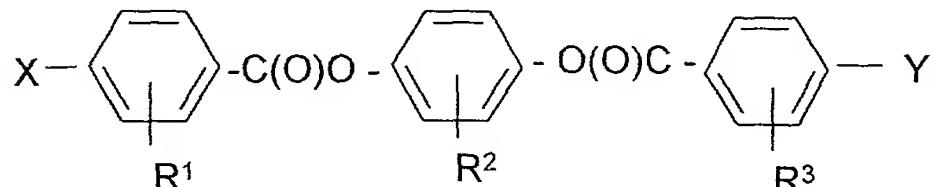
11 R^2 is a bulky organic group having a bulk greater than R^1 and R^3 , whereby, when both
12 R and R^4 are polymerizable groups, said bulk is adapted to provide sufficient
13 steric hindrance to achieve a nematic state at room temperature while

14 suppressing crystallinity at room temperature, thereby providing effective
15 rheology and workability at room temperature; and

16 R¹ and R³ are selected from groups less bulky than R² adapted to form said nematic
17 state.

1 25. The mesogens of claim 24 wherein at least one of R and R⁴ is selected
2 from the group consisting of acryloxy groups and methacryloxy groups.

1 26. Mesogens having the following general formula:



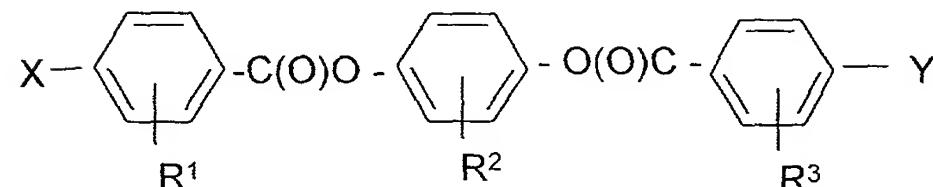
3 wherein

4 X and Y are selected from the group consisting of terminal functionalities and
5 polymerizable groups, and at least one of X or Y comprises a bridging agent;

6 R² is a bulky organic group having a bulk greater than R¹ and R³ whereby, when both
7 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
8 steric hindrance to achieve a nematic state at room temperature while
9 suppressing crystallinity at room temperature, thereby providing effective
10 rheology and workability at room temperature; and

11 R¹ and R³ are selected from groups less bulky than R² which do not interfere with
12 formation of said nematic state.

1 27. Mesogens having the following general formula:



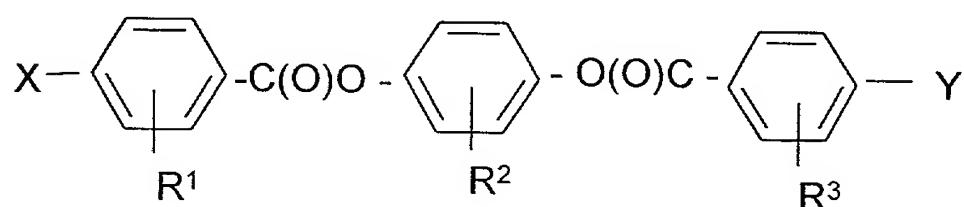
3 wherein

4 X and Y are independently selected from the group consisting of acryloyloxy groups,
 5 methacryloyloxy groups, hydroxyl groups, and acryloyloxy alkoxy groups,
 6 methacryloyloxy alkoxy groups, alkoxy groups and alkoxoyl groups
 7 comprising alkyl groups having from about 2 to about 12 carbon atoms,
 8 wherein at least one of X or Y comprises a bridging agent;

9 R^2 is a bulky organic group having a bulk greater than R^1 and R^3 whereby, when both
 10 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
 11 steric hindrance to achieve a nematic state at room temperature while
 12 suppressing crystallinity at room temperature, thereby providing effective
 13 rheology and workability at room temperature; and

14 R^1 and R^3 are selected from groups less bulky than R^2 adapted to form said nematic
 15 state.

1 28. Mesogens having the following general formula:



3 wherein

4 at least one of X or Y comprises a bridging agent; and
 5 the other of X or Y is independently selected from groups comprising ester groups,
 6 organic acid groups, amine groups, hydroxyl groups, sulfhydryl groups,
 7 groups comprising a polymerizable unsaturated carbon-carbon bond, and
 8 spacer groups;

9 R^2 is a bulky organic group having a bulk greater than R^1 and R^3 whereby, when both
10 X and Y are polymerizable groups, said bulk is adapted to provide sufficient
11 steric hindrance to achieve a nematic state at room temperature while
12 suppressing crystallinity at room temperature, thereby providing effective
13 rheology and workability at room temperature; and
14 R^1 and R^3 are selected from groups less bulky than R^2 adapted to form said nematic
15 state.

1 29. The mesogens of claim 26 wherein said bridging agent comprises a
2 dicarboxoyl group comprising from about 4 to about 12 carbon atoms.

1 30. The mesogens of claim 27 wherein said bridging agent comprises a
2 dicarboxoyl group comprising from about 4 to about 12 carbon atoms.

1 31. The mesogens of claim 28 wherein said bridging agent comprises a
2 dicarboxoyl group comprising from about 4 to about 12 carbon atoms.

1 32. The mesogens of claim 26 wherein said bridging agent comprises an
2 oligodialkylsiloxane comprising alkyl groups comprising from about 1 to about 3
3 carbon atoms.

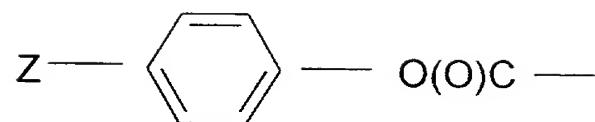
1 33. The mesogens of claim 27 wherein said bridging agent comprises an
2 oligodialkylsiloxane comprising alkyl groups comprising from about 1 to about 3
3 carbon atoms.

1 34. The mesogens of claim 28 wherein said bridging agent comprises an
2 oligodialkylsiloxane comprising alkyl groups comprising from about 1 to about 3
3 carbon atoms.

1 35. The mesogens of claim 1 wherein at least one of X or Y has the
2 following general structure:

3

4

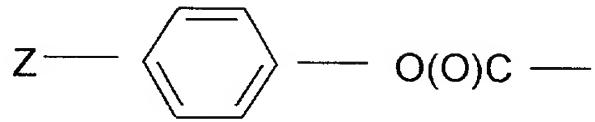


5 wherein Z is selected from the group consisting of a terminal functionality and a
6 polymerizable group.

1 36. The mesogens of claim 7 wherein at least one of X or Y has the
2 following general structure:

3

4

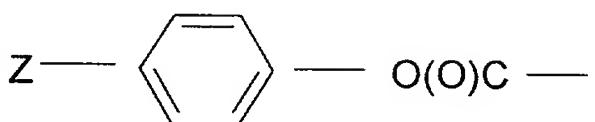


5 wherein Z is selected from the group consisting of a terminal functionality and a
6 polymerizable group.

1 37. The mesogens of claim 15 wherein at least one of X or Y has the
2 following general structure:

3

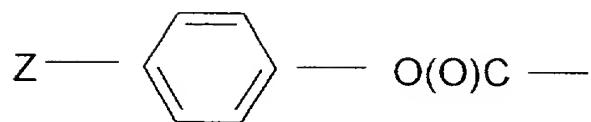
4



5 wherein Z is selected from the group consisting of a terminal functionality and a
6 polymerizable group.

1 38. The mesogens of claim 24 wherein at least one of X or Y has the
2 following general structure:

3



4

5 wherein Z is selected from the group consisting of a terminal functionality and a
6 polymerizable group.

1 39. The mesogens of claim 1 wherein R and R³ are selected from the group
2 consisting of hydrogen and a methyl group.

1 40. The mesogens of claim 7 wherein R and R³ are selected from the group
2 consisting of hydrogen and a methyl group.

1 41. The mesogens of claim 15 wherein R and R³ are selected from the
2 group consisting of hydrogen and a methyl group.

1 42. The mesogens of claim 24 wherein R and R³ are selected from the
2 group consisting of hydrogen and a methyl group.

1 43. The mesogens of claim 24 wherein said alkyl groups have from about
2 2 to about 9 carbon atoms

1 44. The mesogens of claim 24 wherein said alkyl groups have from about
2 2 to about 6 carbon atoms.

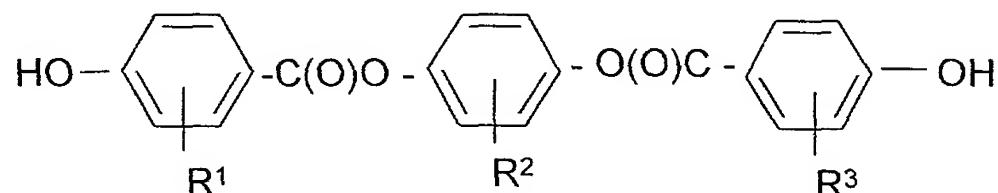
1 45. The mesogens of claim 24 wherein said alkyl groups have 6 carbon
2 atoms.

1 46. The mesogens of claim 24 wherein A is selected from the group
2 consisting of alkyl groups and methyl-substituted alkyl groups having from about 2 to
3 about 9 carbon atoms.

47. The mesogens of claim 24 wherein A is selected from the group consisting of alkyl groups and methyl-substituted alkyl groups having from about 2 to about 6 carbon atoms.

48. The mesogens of claim 24 wherein A has 6 carbon atoms.

1 49. Mesogens having the following general formula:



3 R^2 is a bulky organic group having a bulk greater than R^1 and R^3 whereby, when both
4 terminal OH groups are reacted with a polymerizable group, said bulk is
5 adapted to provide sufficient steric hindrance to achieve a nematic state at
6 room temperature while suppressing crystallinity at room temperature, thereby
7 providing effective rheology and workability at room temperature; and

8 R^1 and R^3 are selected from groups less bulky than R^2 adapted to form said nematic
9 state.

10 50. The mesogens of claim 49 wherein R^2 is selected from the group
11 consisting of alkyl groups having from about 1 to 6 carbon atoms and aryl groups.

12 51. The mesogens of claim 49 wherein R^2 is selected from the group
13 consisting of alkyl groups having from about 1 to about 4 carbon atoms and phenyl
14 groups.

15 52. The mesogens of claim 49 wherein R^2 is selected from the group
16 consisting of methyl groups, t-butyl groups, isopropyl groups, secondary butyl groups,
17 and phenyl groups.

1 53. The mesogens of claim 49 wherein R^1 and R^3 are selected from the

2 group consisting of hydrogen and a methyl group.

1 54. The mesogens of claim 50 wherein R and R³ are selected from the
2 group consisting of hydrogen and a methyl group.

1 55. The mesogens of claim 51 wherein R and R³ are selected from the
2 group consisting of hydrogen and a methyl group.

1 56. The mesogens of claim 52 wherein R and R³ are selected from the
2 group consisting of hydrogen and a methyl group.

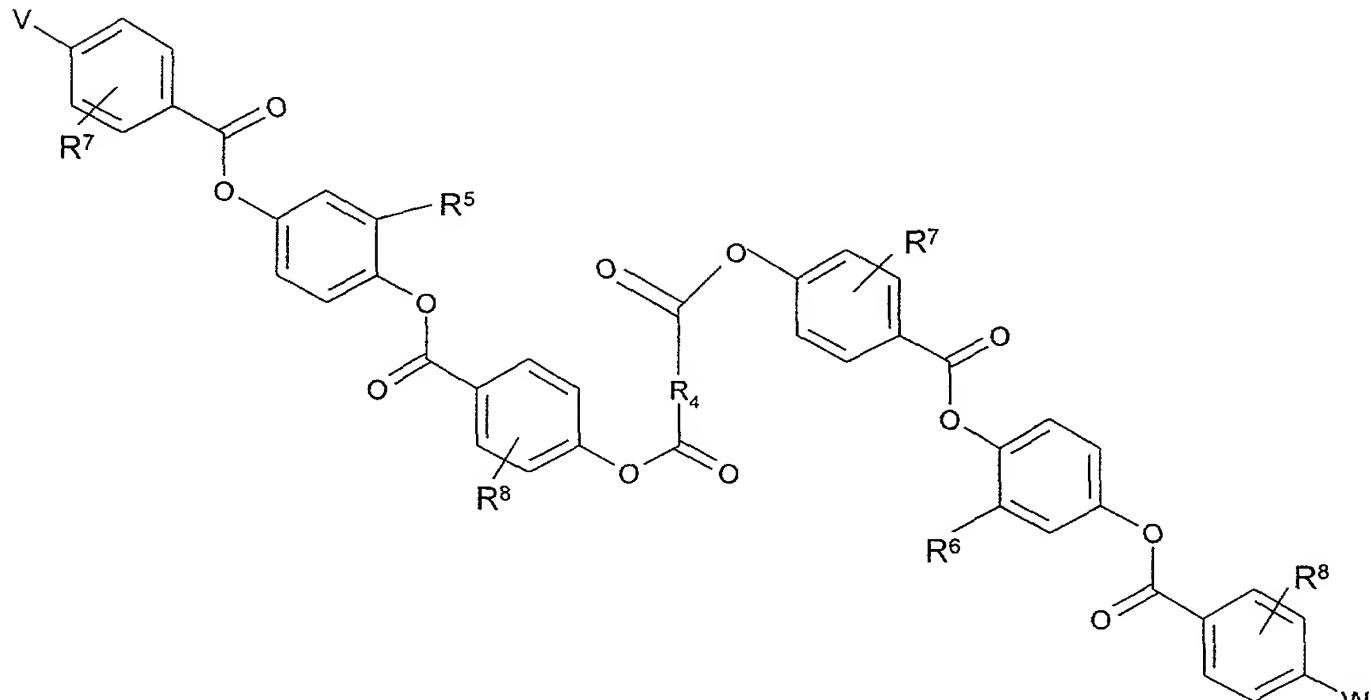
1 57. The mesogens of claim 49 wherein R and R³ are hydrogen.

1 58. The mesogens of claim 50 wherein R and R³ are hydrogen.

1 59. The mesogens of claim 51 wherein R and R³ are hydrogen.

1 60. The mesogens of claim 52 wherein R and R³ are hydrogen.

1 61. Mesogens having the following general structure:



wherein

5 R^4 is an alkylene group having from about 2 to about 20 carbon atoms;

6 R⁵ and R⁶ are selected from the group consisting of hydrogen, halogen, and
7 bulky organic groups; and,

8 V and W independently are selected from the group consisting of terminal
9 functionalities and polymerizable groups.

1 62. The mesogens of claim 61 wherein at least one of R⁵ and R⁶ is a bulky
2 organic group selected from the group consisting of alkyl groups having from about 1
3 to 6 carbon atoms and aryl groups.

1 63. The mesogens of claim 61 wherein at least one of R⁵ and R⁶ is a bulky
2 organic group is selected from the group consisting of alkyl groups having from about
3 1 to about 4 carbon atoms and phenyl groups.

1 64. The mesogens of claim 61 wherein at least one of R⁵ and R⁶ is a bulky
2 organic group is selected from the group consisting of methyl groups, t-butyl groups,
3 isopropyl groups, secondary butyl groups, and phenyl groups.

1 65. The mesogens of claim 61 wherein at least one of R⁵ and R⁶ is selected
2 from the group consisting of methyl groups and t-butyl groups.

1 66. The mesogens of claim 61 wherein R⁴ has from about 2 to about 12
2 carbon atoms.

1 67. The mesogens of claim 62 wherein R⁴ has from about 2 to about 12
2 carbon atoms.

1 68. The mesogens of claim 63 wherein R⁴ has from about 2 to about 12
2 carbon atoms.

1 69. The mesogens of claim 64 wherein R⁴ has from about 2 to about 12
2 carbon atoms.

1 70. The mesogens of claim 61 wherein R⁴ has from about 6 to about 12

2 carbon atoms.

1 71. The mesogens of claim 62 wherein R⁴ has from about 6 to about 12
2 carbon atoms.

1 72. The mesogens of claim 63 wherein R⁴ has from about 6 to about 12
2 carbon atoms.

1 73. The mesogens of claim 64 wherein R⁴ has from about 6 to about 12
2 carbon atoms.

1 74. The mesogens of claim 61 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, sulfhydryl groups, and spacer groups.

1 75. The mesogens of claim 62 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, sulfhydryl groups, and spacer groups.

1 76. The mesogens of claim 63 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, sulfhydryl groups, and spacer groups.

1 77. The mesogens of claim 64 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, sulfhydryl groups, and spacer groups.

1 78. The mesogens of claim 61 wherein said terminal functionalities are
2 hydroxyl groups.

1 79. The mesogens of claim 62 wherein said terminal functionalities are
2 hydroxyl groups.

1 80. The mesogens of claim 63 wherein said terminal functionalities are
2 hydroxyl groups.

1 81. The mesogens of claim 64 wherein said terminal functionalities are
2 hydroxyl groups.

1 82. The mesogens of claim 61 wherein said polymerizable groups are
2 selected from the group consisting of alkenyl ester groups comprising a polymerizable
3 unsaturated carbon-carbon bond wherein said alkenyl group has from about 2 to about
4 12 carbon atoms.

1 83. The mesogens of claim 82 wherein said alkenyl group has from about
2 2 to about 9 carbon atoms.

1 84. The mesogens of claim 82 wherein said alkenyl group has from about
2 2 to about 6 carbon atoms.

3 85. The mesogens of claim 61 wherein V and W independently are
4 selected from the group consisting of acryloyloxy alkoxy groups and methacryloyloxy
5 alkoxy groups.

1 86. The mesogens of claim 62 wherein V and W independently are
2 selected from the group consisting of acryloyloxy alkoxy groups and methacryloyloxy
3 alkoxy groups.

1 87. The mesogens of claim 63 wherein V and W independently are
2 selected from the group consisting of acryloyloxy alkoxy groups and methacryloyloxy
3 alkoxy groups.

1 88. The mesogens of claim 64 wherein V and W independently are
2 selected from the group consisting of acryloyloxy alkoxy groups and methacryloyloxy
3 alkoxy groups.

1 89. The mesogens of claim 69 wherein V and W independently are
2 selected from the group consisting of acryloyl groups and methacryloyl groups.

1 90. The mesogens of claim 73 wherein V and W independently are
2 selected from the group consisting of acryloyloxy alkoxy groups and methacryloyloxy
3 alkoxy groups.

1 91. A composition comprising alkylenedioic bis-(4-{2-R²-4-[4-(hydroxy)-
2 benzyloxy]-phenoxy carbonyl}-phenyl) esters wherein R² is selected from the
3 group consisting of alkyl groups having from about 1 to 6 carbon atoms and aryl
4 groups.

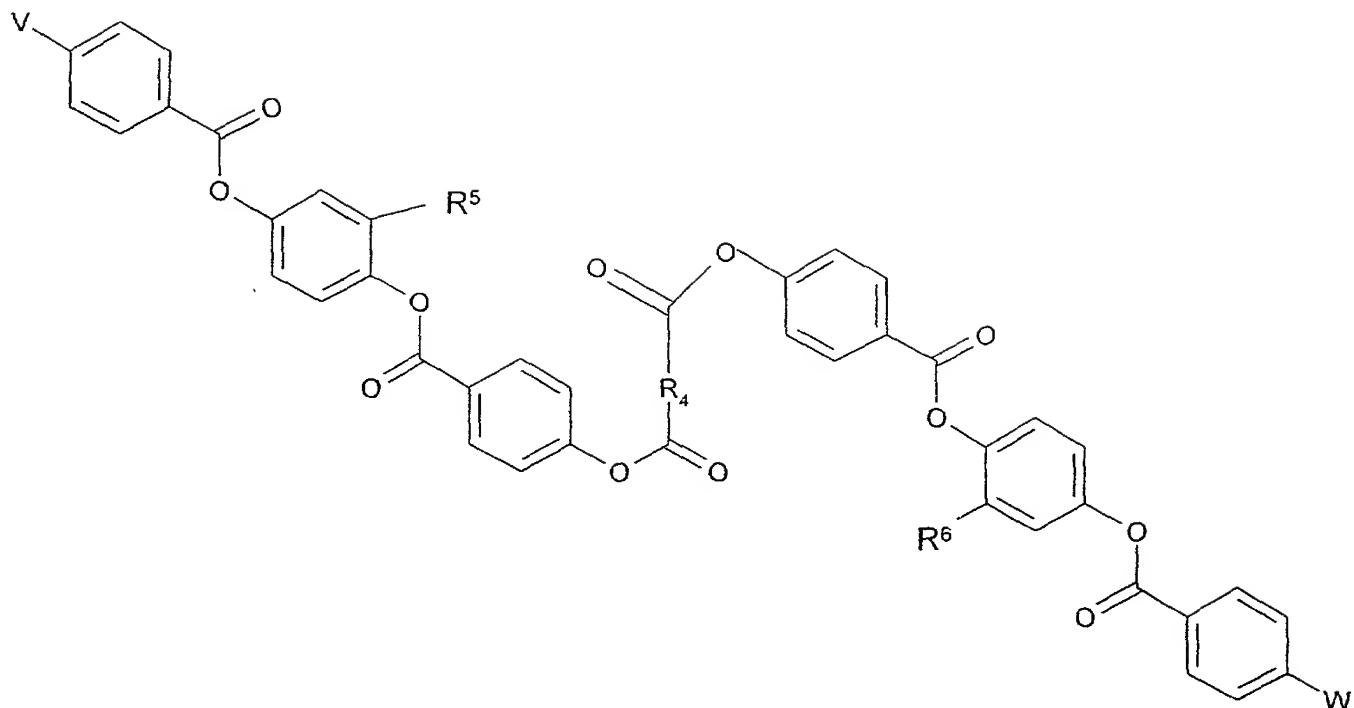
1 92. The composition of claim 91 wherein R² is selected from the group
2 consisting of alkyl groups having from about 1 to about 4 carbon atoms and phenyl
3 groups.

1 93. The composition of claim 92 wherein R² is selected from the group
2 consisting of methyl groups, t-butyl groups, isopropyl groups, secondary butyl groups,
3 and phenyl groups.

1 94. The composition of claim 91 wherein R² and R² are selected from the
2 group consisting of methyl groups and t-butyl groups.

1 95. A composition comprising decanedioic acid bis-(4-{2-tert-butyl-4-[4-
2 (2-methyl-acryloyloxy)-benzyloxy]-phenoxy carbonyl}-phenyl) ester.

1 96. A composition comprising a mesogen having the following general
2 structure:
3



5 wherein

6 R^5 and R^6 are selected from the group consisting of hydrogen, halogen, alkyl
 7 groups having from about 1 to 6 carbon atoms, and aryl groups; and,
 8 V and W independently are selected from the groups comprising
 9 polymerizable groups and terminal functionalities.

1 97. The composition of claim 96 wherein V and W independently are
 2 selected from the group consisting of acryloyloxy groups, methacryloyloxy groups,
 3 acryloyloxy alkoxy groups and methacryloyloxy alkoxy groups.

1 98. The composition of claim 97 wherein R^5 and R^6 are selected from the
 2 group consisting of alkyl groups having from about 1 to about 4 carbon atoms and
 3 phenyl groups.

1 99. The composition of claim 97 wherein R^5 and R^6 are selected from the
 2 group consisting of methyl groups, t-butyl groups, isopropyl groups, secondary butyl
 3 groups, and phenyl groups.

1 100. The composition of claim 97 wherein R^5 and R^6 are selected from the

2 group consisting of methyl groups and t-butyl groups.

1 101. The composition of claim 98 wherein R⁵ and R⁶ are selected from the
2 group consisting of alkyl groups having from about 1 to about 4 carbon atoms and
3 phenyl groups.

1 102. The composition of claim 98 wherein R⁵ and R⁶ are selected from the
2 group consisting of methyl groups, t-butyl groups, isopropyl groups, secondary butyl
3 groups, and phenyl groups.

1 103. The composition of claim 98 wherein R⁵ and R⁶ are selected from the
2 group consisting of methyl groups and t-butyl groups.

1 104. The composition of claim 97 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, and sulphydryl groups.

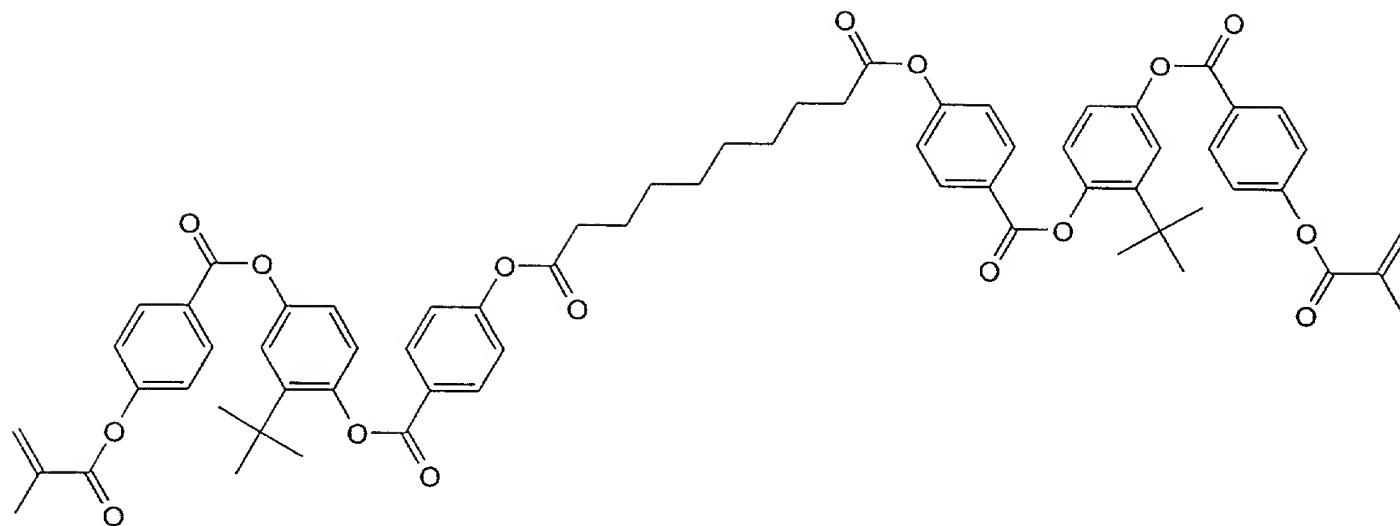
1 105. The composition of claim 97 wherein said terminal functionalities are
2 hydroxyl groups.

1 106. The composition of claim 102 wherein said terminal functionalities
2 independently are selected from the group consisting of hydroxyl groups, amino
3 groups, and sulphydryl groups.

1 107. The composition of claim 102 wherein said terminal functionalities are
2 hydroxyl groups.

1 108. A composition comprising a mesogen having the following general
2 structure:

3



$C_{66}H_{66}O_{16}$
Exact Mass: 1114.44
Mol. Wt.: 1115.22
C, 71.08; H, 5.97; O, 22.95

4
5

1 109. The mesogens of claim 1 wherein said polymerizable groups are
2 groups adapted to be polymerized by either free radical polymerization or by Michael
3 addition.

1 110. The mesogens of claim 7 wherein said polymerizable groups are
2 groups adapted to be polymerized by either free radical polymerization or by Michael
3 addition.

1 111. The mesogens of claim 15 wherein said polymerizable groups are
2 groups adapted to be polymerized by either free radical polymerization or by Michael
3 addition.

5